



4. (Original) A method of predicting deformation and fractures of bone using the model as defined in claim 1.
5. (Original) A method of identifying the requirements of bone reconstruction and prosthesis using the model as defined in claim 1.
6. (New) The method of claim 4, further comprising comparing the model of macrostructural characteristics of the bone with a subject bone and predicting deformation or fractures of the subject bone based upon the differences in the model of bone and the subject bone.
7. (New) The method of claim 5, further comprising comparing the model of macrostructural characteristics of the bone with a synthetic bone and designing the synthetic bone to have similar hierarchical structure and hierarchical mechanical properties as the model of bone.
8. (New) The method of claim 5, further comprising comparing the model of macrostructural characteristics of the bone with a subject bone to be reconstructed or grafted, and reconstructing or grafting the subject bone based upon the hierarchical structural and mechanical properties of the model of bone.
9. (New) The method of claim 5, further comprising comparing the model of macrostructural characteristics of the bone with a subject bone to receive screws or prostheses, and determining placement of the screws or the prostheses in the subject bone based upon the hierarchical structural and mechanical properties of the model of bone.